REPUBLIC OF MALI

VILLAGE POWER 2000

VILLAGE-DRIVEN FOREST MANAGEMENT

THE CASE OF MALI

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Geographic location

Mali is in the middle of West Africa, with Guinean forests to the south and the Sahara desert to the north.

Surface area : 1,241,231 km2

Population : 10 million (approx.)

Proportion of rural dwellers : 80%

Population growth rate : 2.2 % (1998).

Population density: variable, from 1 inhab/km2 in the North to 30 inhab/km2 in the South.

Climate: variable, ranging from the Guinean type in the South to the Saharan type in the North.

The country can be divided into six agro-climatic zones, which are as follows from North to South :

- Saharan,
- Northern Saharan,
- Southern Saharan,
- Northern Sudanian;
- Southern Sudanian; and
- Northern Guinean.

Ecological diversity manifests itself in forested stands characterized by varying levels of productivity, as follows:

- wooded savanna in the North, which typically produces less than 10 m3/ha of wood;
- mixed scrubland producing anywhere from 20 to 40 m3/ha;
- Sudano-Guinean zones, which produce between 50 and 80 m3/ha; and
- Forests of varying density in the western part of the country, which can produce over 100 m3/ha .

Characteristics of the energy sector

The energy sector is characterized by:

- an overexploitation of finite forestry resources;
- its great potential for hydroelectric energy and renewable energy resources, the development of which is costly; and
- its total dependency upon imported petroleum products.

Characteristics of the household energy sub-sector

The place of household energy in the country's energy balance

X Household energy consumption accounts for nearly 90% of national energy consumption, and relies almost entirely (i.e., nearly 99%) upon traditional energy sources.

Table 1 : Household energy in the country's energy balance, 1997 (t.o.e. = tons of oil equivalent)

Energy sources	Households & government offices		Total	
	>000s t.o.e.	%	>000s t.o.e.	%
Conventional energy sources	**30.07**	***1.3%***	**294.26**	***11.1%***
	10%		*100%*	
Electricity	11.48	*0.5%*	23.34	*0.9%*
	49%		*100%*	
Coke	0	*0.0%*	0.01	*0.0%*
Petroleum products, incl:	18.59	*0.8%*	270.91	*10.2%*
	7%		*100%*	
Gasoline	0	*0.0%*	75.83	*2.9%*
DDO/diesel oil	0	*0.0%*	145.42	*5.5%*
Fuel oil	0	*0.0%*	1.31	*0.0%*
Kerosene	16.67	*0.7%*	46.43	*1.8%*
Butane gas	1.92	*0.1%*	1.92	*0.1%*
Traditional energy sources	**2 347.82**	***98.7%***	**2 353.82**	***88.9%***
	100%		*100%*	
Firewood	1 996.82	*84.0%*	1 999.82	*75.5%*
Charcoal	63	*2.6%*	63	*2.4%*

Energy sources	Households & government offices		Total	
	>000s t.o.e.	%	>000s t.o.e.	%
Plant residues	288	*12.1%*	291	*11.0%*

Household fuels

- A National Anti-Desertification Plan *(Plan National de Lutte contre la Désertification*, PNLCD) was initiated in 1987.

This Plan included a Household Energy Strategy *(Stratégie d'Energie Domestique,* **SED**) launched in early 1990s. It's a new approach witch introduce to reduce demand for, and increase the supply of, wood-based fuel . SED was drawn up with financial and technical support from the Netherlands and the World Bank.

Two Main Goals of the SED:

X At the demand level: to improve access to energy and increase usage efficiency, especially regarding the more modern forms of energy, and to thus improve daily living conditions of a portion of the Malian population;

X At the supply level: to create conditions in which the processes whereby wood-based fuels are supplied contribute to economic development instead of harming the environment, through rational management of forestry resources by rural communities.

Four Basic Themes of the SED:

X Provision of varied, high-performance and appropriate materials and services in the area of household energy, at the same time using existing commercial networks and fostering competition;

X A true transfer of responsibility to local collectivities for the management of natural resources, through the reform of regulations pertaining to the use, transport and trade in wood-based fuels, and by giving those collectivities the necessary technical support;

X Better alignment of household fuel prices with their actual economic costs;

X Effective coordination of interventions, with the help of a flexible and streamlined institutional set-up and a system of ongoing information and evaluation relating to the household energy sub-sector.

Phase 1 of the SED was drawn up in 1996 – 2000 with financial support of IDA (US$1 million); Netherlands (US$ 3.5 million) and the Global Environmental Facility - GEF- (US$ 2.5 million).

Forestry Regulation

The "Supply" component of the Household Energy Strategy (*Stratégie d'Energie Domestique*, **SED**) relies upon forestry legislation and regulation aimed at participatory and decentralized management of natural resources.

Situation prior to 1990

Malian forestry regulations at that time were characterized by:

- protectionist policing measures;
- repressiveness;
- a chronic dearth of human and material resources within the forestry service.

Results: uncontrolled resource exploitation, which spurred the process of desertification.

Beginning in the 1980s: there was a growing awareness and a willingness to encourage populations to assume greater responsibility in the overall development process. However, the generally authoritarian political climate did not allow for any substantial change.

Situation after 1990: changes

In the wake of the popular uprising of March 1991, rural populations laid claim, sometimes violently, to the resources found on their village lands and, in short, demanded the right to participate in the nation's affairs.

- Reforms were adopted to allow populations to assume responsibility and participate effectively in the country's process of sustainable economic and social development.

- A legal and legislative framework was created to encourage populations to manage natural resources.

The following developments should also be noted:

- the policy on decentralization: approved on February 11, 1993, Law No. 93-008 sets out the conditions under which territorial collectivities can be freely administered and grants resource management prerogatives to those collectivities.

- the national environment action plan;

- the new forestry policy;

- ratification of the International Anti-Desertification Convention;

- restructuring of the Water and Forestry Department (*Service des Eaux et Forêts*) in order to adapt it to the new rural development policy.

- Implementation of Household Energy Strategy (*Stratégie d'Energie Domestique*, SED).

HOUSEHOLD ENERGY STRATEGIE (Stratégie d'Energie Domestique, SED)

In connection with the SED, the following laws were drawn up and promulgated:

- Law N° 95-003, dated January 18, 1995, concerning organization of the exploitation, transport and trade in wood;

- Law N° 95-004, dated January 18, 1995, setting out the terms and conditions of forest resource management.

There has been a trend towards strengthening the principle of assigning greater responsibility to all actors involved in natural resource management, and a move to define broad policy themes.

The task of implementing the details of these laws is left up to the territorial collectivities.

Law N° 95-004, dated January 18, 1995, which states the conditions for the management of forestry resources, made it possible to :

- transfer to territorial collectivities responsibility for the management and monitoring of the exploitation of wood resources and for the primary trade in wood-based energy sources within their purview ;

- motivate local collectivities to create rural wood markets and develop forest stands;

- effectively monitor the wood-based energy production stream;

- influence the sale price of wood-based energy sources;

- generate individual and collective revenues at the level of the primary rural producer ;

- promote the adoption of substitute fuels and the dissemination of improved cookstoves and ovens;

- generate substantial revenue for the sector.

Law N° 95-003, dated January 18, 1995, concerning organization of the exploitation, transport and trade in wood, had the following impacts:

- it allows for greater professionalization of activities related to the exploitation, transport and trade in wood, and authorized the creation of approved rural wood markets;

- it enables populations, collectivities and the Government to generate revenues within a context of coordinated and sustainable management of wood resources;

- it creates a framework for collaboration by promoting well-structured socio-professional organizations such as the Rural Management Structures (*Structures Rurales de Gestion*, **SRGs**).

The SRGs supply and manage rural wood markets in accordance with an annual quota set in advance by an ad hoc commission created at the level of rural collectivities (*communes)*.

The law establishes a typology of forest exploitation. The three modes of exploitation are: «regulated», «guided» and «unregulated».

The first two types are handled by the SRGs and the duly registered owners of forests.

The third mode of exploitation (i.e., unregulated) can only be engaged in by private parties (individuals) possessing a usage permit for a borderless and undeveloped area.

The law institutes the practice of the transport coupon, issued by the forestry administration to owners of tree plantations or private forests and to SRGs to allow the transportation of wood-based fuel.

Decree N° 98- 402, dated December 17, 1998 sets out the modes of recovery and allocation of taxes collected in connection with the exploitation of wood in Government-owned forests.

This decree sets out the allocation, among the various parties involved, of usage taxes applicable to Government-owned forestry resources, as follows :

ALLOCATIONS	SHARE BASED ON ORIGIN OF THE WOOD		
	Unregulated	Guided	Regulated
Government Budget	60 %	35%	15%
Development and maintenance of forest stands.	-	30%	45%
Forest monitoring	35%	15%	10%
Rural *communes*	-	5%	10%
Regional Chambers of Agriculture	-	5%	10%
Forestry Agents	5%	5%	10%

MASTER WOOD-BASED ENERGY SUPPLY PLANS FOR URBAN AREAS (*SCHEMAS DIRECTEURS D'APPROVISIONNEMENT DES VILLES EN BOIS-ENERGIE*, SDA)

Definition

- The SDA is a guidance, planning and monitoring tool that serves as the basis for streamlining the management of wood resources located in the area supplying a city ;
- It also provides for the necessary reorganization of the trade, exploitation, transport and distribution stream involved in providing wood-based fuel to cities.

Goal :

- to determine how supply flows should be adjusted; and
- to identify zones requiring priority intervention.

Utility :

The SDA makes it possible to create the statistical and cartographic database needed to monitor zones of forestry exploitation in accordance with ecological and socio-economic plans.

Methodological principles underlying the SDA

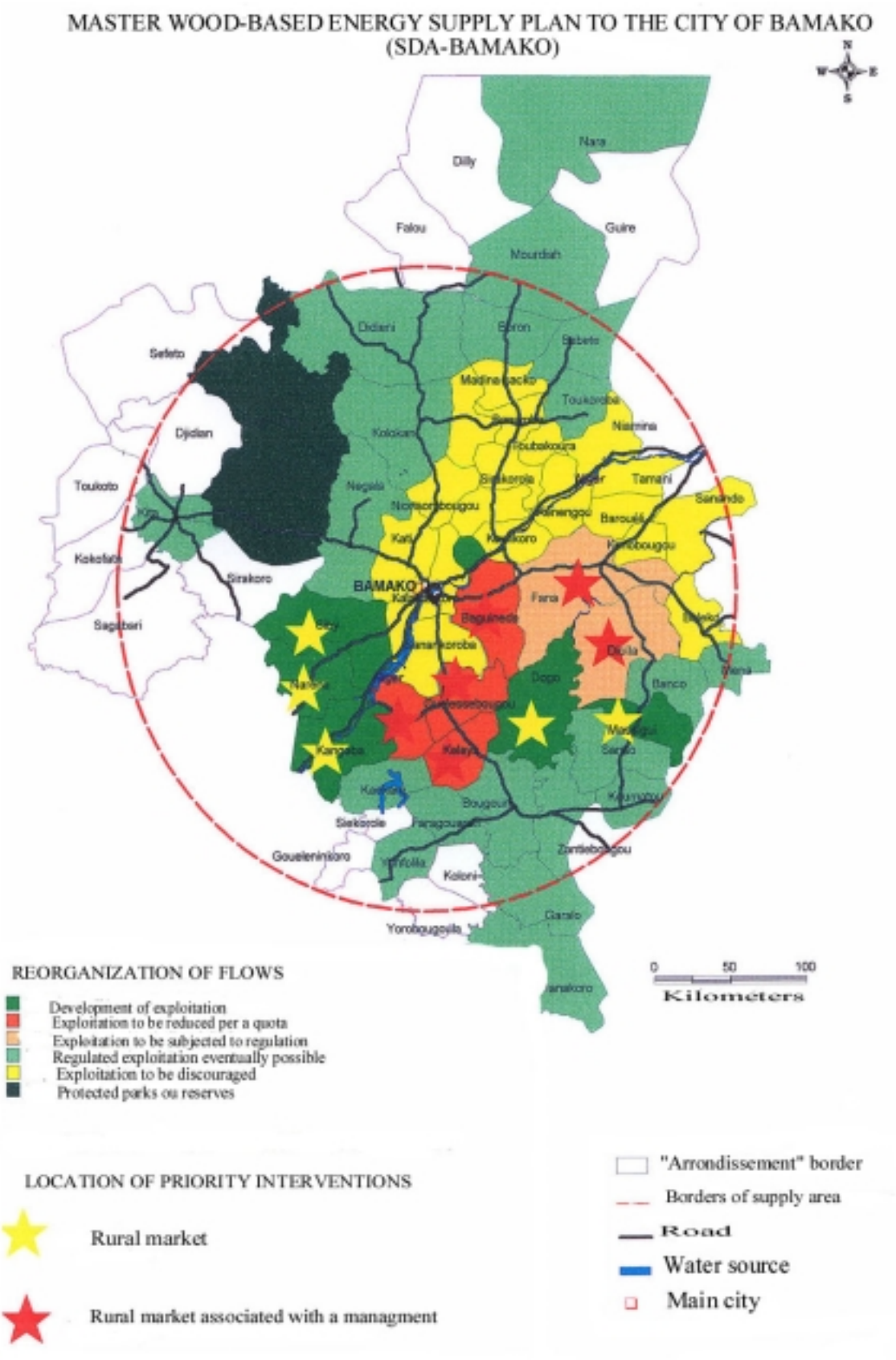
The data needed to draw up SDAs come from three broad areas :

The volume of wood resources usable as fuel ;

Currently existing networks of wood fuel or charcoal exploitation and marketing;

Modes of wood resource management by rural populations.

The methodology used to develop the Master Plans (SDAs) is based on a three-way zoning of wood resources, commercial wood exploitation and local agro-socio-economic dynamics.


MASTER WOOD-BASED ENERGY SUPPLY PLAN TO THE CITY OF BAMAKO
(SDA-BAMAKO)
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Gouleninsoro
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Yorobougoula
Garalo
Kolondieba
0
50
100
Kilometers
REORGANIZATION OF FLOWS
Development of exploitation
Exploitation to be reduced per a quota
Exploitation to be subjected to regulation
Regulated exploitation eventually possible
Exploitation to be discouraged
Protected parks ou reserves
LOCATION OF PRIORITY INTERVENTIONS
Rural market
Rural market associated with a managment
"Arrondissement" border
Borders of supply area
Road
Water source
Main city

The logical steps in the development of an SDA are as follows:

***First phase* : Assessment of wood resources**

Inventory of the stock of available wood that can be used for fuel, i.e., its nature, quantity and location;

Assessment of annual production (i.e., the quantity that can be exploited annually without reducing the wood "capital"): its nature, quantity and location.

***Second phase* : Assessment of flows of wood-based fuels**

Assessment of flows of wood-based fuels towards cities, broken down by product (i.e., wood and charcoal) and by geographic origin;

Identification of urban supply networks (for wood and charcoal) and of the parties involved in them;

Assessment of urban trends in wood and charcoal consumption.

***Third phase* : Modes of management of wood resources by rural populations**

Assessment of rural consumption of wood-based energy sources;

Diagnostic of modes of wood resource management by rural populations: identification of ecological, social and economic factors that determine the production and exploitation of wood and charcoal;

Identification of areas where these factors are resulting in relatively homogeneous trends in availability of wood resources (i.e., zoning of the supply area).

***Fourth phase* : Bottom line and synthesis**

Determination of the balance between annual wood production and cutting ;

Determination of strategies appropriate to each zone and priority interventions.

RURAL WOOD FUEL MARKETS

What is a rural wood market ?

The rural wood market can be defined as a point of sale managed by an approved Rural Management Structure (*Structure Rurale de Gestion*, **SRG**).

Such a market is supplied by a usage/cutting area, the boundaries of which are defined by common agreement between the SRG and the Forestry Administration (*Administration chargée des Forêts),* until such time as the decentralization is implemented.

Objective : to alter not only the flows of wood from the spatial and quantitative standpoints, but also to change the terms of trade, by returning to rural populations the responsibility for managing wood resources on their village lands and by strengthening rural populations' negotiating position vis-à-vis professionals involved in the wood sector (e.g., transporters).

Goals :

- to help improve rural living conditions by providing steady income derived from the rational exploitation of forests;

- to ensure rational and sustainable management of forestry resources through an annual exploitation quota;

- to help reorganize the marketing and distribution system for wood and charcoal.

Essential requirements for setting up a rural market :

- the Rural Management Structure (SRG), which is an approved organization of rural wood producers geared to supplying a rural market;

- an annual marketable quota set by a commission responsible for fixing quotas;

- a place where selling takes place (i.e., a single point of sale);

- transport coupons issued to the SRG upon payment of the usage tax in accordance with the quota.

PROFESSIONALS IN THE WOOD-BASED FUEL SECTOR (PWFs)

Definition

A **PWF** can be defined as any operator involved in the production stream, from the primary production phase (i.e., woodcutting in forest stands), to transport and storage and, finally, to distribution to consumers.

The following are included among PWFs :

- Rural Management Structures (SRGs) at the rural level;
- Urban Fuelwood Marketing Structures (*Structures Urbaines de Commercialisation de Bois-Energie,* SUCBE) at the urban level; and
- Members of Trader/Transporters Associations.

Studies conducted under the Project in the country's main cities have yielded the following information, to be used to organize and support the aforementioned entities:

- the number of SRGs created;
- categories of PWFs (traders, transporters and trader/transporters);
- membership numbers, broken down by association, city and gender;
- types of vehicles/machinery used and the level of use (e.g., % for the transport of wood-based fuels);
- breakdown of PWFs into wholesalers, semi-wholesalers and retailers.

The role of PWFs

- PWFs participate, in collaboration with forestry services and villagers, in the effort to preserve wood resources.
- They support and ensure effective and efficient participation in the pursuit of the SED's objectives, by refraining from unregulated exploitation and by obtaining their wood supplies legally from rural fuelwood markets.

MODERNISATION OF THE CHARCOAL SECTEUR

The transition to charcoal

Facts and figures

- In the early 1990s, nearly all Malian households used wood for cooking.
- In Mali's cities, but mainly in Bamako, charcoal has now supplanted fuelwood.

Example : The percentage of households using charcoal in the city of Bamako has evolved as follows:

- in 1978 - 3% ;
- in 1989 - 11% ;
- in 1995- 18 % et
- 2000 - over 60% .

In terms of consumption:

- 15,800 tons in 1990 ;
- 38,000 tons in 1995 et
- 80,000 tons in 2000.

Causes of the transition to charcoal

X characteristics of charcoal in comparison to fuelwood: easy to use, clean, requires less work and does not generate smoke;

X rapid urbanization, and its corollary, changes in housing styles;

X decreased size of households;

X demands of modern life;

X desire for greater comfort: this is a universal human aspiration and, as far as cooking is concerned, the top level of luxury is currently considered to be charcoal.

VILLAGE LEVEL FORESTRY DEVELOPMENT

Definition

Village-level forestry is a system of managing wood resources implemented by a rural management structure under a contract with the Forestry Administration or the Decentralized Collectivity, with the aim of ensuring rational exploitation of an area developed in order to supply a particular rural market.

The Project's role was conceived essentially as one of providing information, support for the emergence of local initiatives, technical and organizational support, and monitoring.

Methodology for the creation of rural wood markets

The methodology consists of the following main steps:

- a national and local information campaign;
- development of the Master Plan for Woodfuel Supply (*Schéma Directeur d'Approvisionnement*, SDA) ;
- inventory of candidate villages and the choice of sites;
- surveys (covering sociology, land tenure, woodcutting, the production stream and pastoral factors) ;
- establishment of SRG offices ;
- training of the parties involved;
- fixing boundaries of the wood collection zone;
- assignment of the annual quota.

The role of private operators in the creation of rural markets

- Implementation of an information campaign ;
- Conduct of surveys ;
- Participation in the choice of villages, definition of tree stand boundaries and in the choice of market sites ;
- Development and implementation of the training/support program for SRGs ;
- Development of quotas by the commission charged with this task;
- Drawing up a development plan.

Forestry Monitoring

Forestry monitoring:

- is a crucial ingredient in the success of the rural market operation;

- ensures that the SRGs' markets will function properly;

- enables the Government to determine with certainty that taxes paid correspond to the volume of product exploited;

- ensures the survival of forest stands through the rigorous monitoring of directives contained in the development plans, management plans and management contract.

The success of rural markets will depend upon effective monitoring.

RESULTS OF INTERVENTIONS, AND LESSONS LEARNED

a- Development and validation of Wood Fuel Supply Master Plans (SDAs) for 7 cities in the country : Bamako, Ségou, Mopti, Koutiala, Niono, Kayes and Sikasso.

This makes it possible today to know how much wood-based energy equivalent is available in each collection area, to forecast trends through the year 2010, and to envisage solutions to reverse unfavorable trends.

b- Village-level forest plantings and the creation of over 240 rural markets for wood-based energy in the zones supplying Bamako, Ségou and Koutiala.

Phase 1 of the SED resulted in the development of the methods and tools needed to establish the rural markets.

- Over 200 rural markets are now functioning in Mali. These markets cover about 15% of the surface area of the priority zones defined under the SDAs, and represent a potential sustainable production of about 100,000 tons per year.

- With the creation of markets recognized by local and national authorities, access to the resource and the supply of urban centers is henceforth regulated: professionals in the wood-based energy sector are obligated to obtain their supplies from these markets and to pay the corresponding tax which is distributed among the various participants in accordance with Decree No. 402.

- Rural populations now perceive the importance of the forest and the need to protect it, since it produced income that supports, among other things, such development activities as health and education infrastructures and reafforrestation..

- the charcoal supply area serving Bamako is now better understood, in terms of:
  - socio-economic conditions, since the potential scope of rural charcoal-making activity is known;
  - the production stream's discriminating criteria, which have been determined;
  - the forms and types of support to producers, which have been identified.

Thus, the following concrete results have been achieved:

- completion of thirteen yield tests of traditional and Casamance-style charcoal kilns.

  Performance of the improved charcoal-making kilns is as follows:
  - 30% increase in average yield;
  - greatly reduced duration of carbonization;
  - improved quality of charcoal.

- training of over 260 charcoal-makers (men and women) in the use of the Casamance-style charcoal-making kiln and other types of improved kilns.

- dissemination, to charcoal makers under a rental purchase arrangement, of about one hundred charcoal aeration conduits.

c) **Provision of a Permanent Information and Evaluation System (*Système d'Information et d'Evaluation Permanent,* SIEP) and a GLOBUS model**

The Project is now equipped with the following tools for the guidance and monitoring of the household energy sector, and for forecasting:

- the SDAs,
- the SIEP; and
- the GLOBUS model for simulating trends in the sub-sector, and for recording data obtained from focus groups.

The SIEP makes it possible to :

- (i) understand the situation in order to be able to intervene as effectively as possible; and
- (ii) forecast trends in such a way as to be able to adjust and adapt interventions to those trends. An information bulletin on the sector is published twice yearly.

The GLOBUS model, which is an improved version of the SIEP, is intended to provide Project participants and the Project's financial contributors with a tool for evaluating the impact of project activities.
GLOBUS is a tool for modeling over a 20-year timeframe, and is designed in accordance with three principles, namely:

- capacity for adaptive change;
- use of the least unfavorable hypothesis possible; and
- compatibility with other tools used under the Project.

OUTLOOK FOR THE HOUSEHOLD ENERGY STRATEGY (SED)

The first phase of the Household Energy Project, which began in January 1996, will conclude on December 31, 2000.

Conclusions emerging from assessments conducted in October 1999 by the Government of the Netherlands and in June 2000 by the World Bank, are as follows:

- Project execution has been satisfactory;
- Several Project activities have exceeded initial objectives:
    - Number of improved cookstoves distributed;
    - Number of SDAs drawn up;
    - Number of rural markets that have become operational.

However, this degree of progress does not yet guarantee the sustainability of all Project activities, especially as regards:

- enforcement of legislation pertaining to wood-based energy, which has proved difficult; and
- monitoring, which needs to be improved.

In order to consolidate accomplishments under Phase 1, both parties (i.e., the Malian Government and the donors) have decided to launch a second phase which is to include the launching of an ambitious household energy program (*Programme d'énergie domestique avec un accès universel*, PEDAU) geared to providing universal access to services in the rural area.